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ABSTRACT

This experiment, one of four in a series dealing with day care, examines the verbalizations of 36- to 40-month-old children in family and group day care environments. Verbalizations were classified as simple or complex. Frequency of verbalizations in specific day care settings was recorded. A total of 48 subjects participated: 16 in the family day care setting, 16 in the group day care setting, and 16 controls in their home environment. Results indicate that the greatest number of complex verbalizations were produced in the family day care setting, the next largest number the home environment, and the lowest number in the group day care setting. Discussion centered on the influences of different environments in producing different levels of verbalizations, and other variables which may affect verbalizations in group day care centers. Appendixes include speech samples, observer scheduling, and comparison data. (Author/SDH)

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THE DIFFERENTIAL STRUCTURAL CHARACTERISTICS OF SENTENCES FORMED BY PRESCHOOL CHILDREN IN FAMILY AND GROUP DAY CARE CENTERS

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PS 007091

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August 1973

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ABSTRACT

This experiment examines the verbalizations of 36-40 month old children in two different day care environments--Family and Group Day Care. Verbalizations were classified as simple or complex. Frequency of verbalizations in specific day care settings were recorded. Forty-eight Ss participated: 16 in the Family Day Care Setting, 16 in the Group Day Care Setting, and 16 controls in their Home environment. Results indicate that the number of complex verbalizations that were made were greater in the Family Day Care Setting, followed by the Home environment, and lastly by the Group Day Care Setting.

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There are many theories concerning preschool education and the various approaches to curriculum development. Three basic approaches to curriculum development cited by Swenson (1972) are: cognitive (e.g. Weikart, 1969); socio-emotional (e.g. Evans, 1971); and language development (e.g. Evans, 1971). The primary assumption underlying language based curricula is that language development is the foundation of all learning, since without command of words, a child not only has a hard time communicating, but he or she has a hard time thinking (Swenson, 1972). There are currently a number of language based programs in use, such as: the Tucson Early Education Model (1970), Bereiter-Engelmann Structural Pedagogy (1969), and the early intervention programs of Karnes (1969), Palmer (1970), Gordon (1969), and Levenstein (1970). The Bereiter-Engelmann Language curriculum is composed of an integrated set of basic concepts, sentence forms, and presentation strategies. It is recognized by Bereiter-Engelmann that academic success requires a functional repertoire of basic concepts and language skills (Evans, 1971).

Some research (Ervin, 1964) has indicated that language is acquired through modeling (modeling from adults, in particular parents). Two assumptions need to be made here: (1) that the best environment for a child in learning his language is the home environment with both parents present providing the child with adequate language modeling (it is assumed that the parents are loving, stable individuals concerned about the welfare of their child). Data from parent training projects (Levenstein, 1970) provides support for this assumption. (2) Also an assumption is made that when a child leaves his home and enters an environment similiar to his home that the verbalization levels/language production will be equivalent in both settings (Sale, 1973). With these above assumptions, if a child does model the speech of his parents then learning environments most closely resembling the home environment will be best for the child's language development. Therefore, possibly a "Cooperative" where the child's mother is present for part of the day or a "Family Day Care Center" in which a caregiver in the mother's community would be taking care of the children in their own neighborhood in a house very similiar to the children's own home would be most conducive to the child's language development.

However, if children learn language through modeling from peers, then what would be a conducive environment for their language development (Grotberg, 1971)? Probably a larger center with highly verbal children interacting greatly would be more appropriate. To some extent these two premises will be assessed in this study; that is, the proposal is directed at the question of whether children verbalize at a more sophisticated level in one of the following environments: a Group Day Care Center, or a Family Day Care Center.

It is perhaps important to first describe the stage of language development of a three year old, the likely recipient of day care. According to McNeill (1970) a child's speech at age three can be categorized by particular sentence patterns that correspond to basic grammatical relations of two types: the first contains sentences with a noun and verb or a main verb and object. The second consists of a head noun, modifier, main verb and object. These classifications provide criteria for categorizing the verbalizations the children will be making in the various environments.

In a recent study Cazden (1966) found that children in the age range 36-40 months old were producing utterances that were approximately 3.60 morphemes in length.

It was further found that the level of noun phrases were more developed in an object position than in a subject position. This effect along with McNeill's sentence patterns provided the basis of analysis of verbalizations and sentence structures in this study.

A pilot study using these criteria has been conducted (Fiene, 1972b). The subjects were five male and five female children 36 to 50 months of age attending a day care center with approximately 25 children. Verbalizaions were categorized by simple (e.g. I go) or complex (e.g. I will go but not now). In a design like LeLaurin and Risley (1972) ten children were observed in both Group and Family Day Care settings. For a month, the group was in the Group Day Care Center (population approximately 25 children) in which observations of verbalizing during activites were taken. During a second month following the divison of the children into several Family Day Care Centers (each center with a population of five children), the group was observed while engaging in similiar activities. Results suggested that the children produced more sophisticated sentence structures (i.e. there were more complex than simple sentences produced) in the Family Day Care Centers than in the Group Day Care Centers.

However, there were many problems with these data:

the sample was too small. The children were matched only for IQ, not for other relevant variables. The age range was too wide, and the staff were not trained for the type of verbal interactions with subjects.

This experiment carried out in a natural setting studied the types of verbalizations that 36-40 month old children made in three different custodial settings--Family Day Care Centers, Group Day Care Centers, and Home environments. The following predictions were made: first, that children verbalize more in a Family Day Care Center than in a Group Day Care Center; and second, that the nature of the verbalizations produced by the children in the Family Day Care Centers is more sophisticated than the verbalizations produced in the Group Day Care Centers. The latter being operationalized in terms of sentence complexity.

METHOD

Subjects:

Subjects were 48 Caucasian children, 36-40 months of age, attending Day Care Centers at least six hours daily. Eight children, four males and four females, were selected from two Large Group Day Care Centers[1] (N=16). Four children, two males and two females, were selected from four Family Day Care Centers[2] (N=16). Sixteen children, eight males and eight females, were selected from 16 Homes[3] (all single child families). The latter group acted as the control group.

---

1 Large Group Day Care Center--a typical Nursery School or Day Care Center with a population of about 45 children. The 16 Ss used for this experiment were selected from the total population of 90 children from the two Group Day Care Centers.

2 Family Day Care Center--neighborhood mother who acts as a caregiver for her own children and usually 3-4 of her neighbor's children.

3 The homes were selected by the observers who were familiar with the local area that the centers and homes were located. However, none of the observers knew the parents personally who were selected for the in-home group. This home group was compiled through friends of the observers who knew of people who were one child families with the particular child in the age range that was needed for the study

Subjects were matched for age, sex, race, IQ (Bayley Scales of Intelligence was used[4]). See Table 1 for results of matching. Staff, programs, and content were matched in homes and centers for type of structured day, scheduling, and planned activities. All the centers were nursery school programs with equal emphasis on all curriculum areas--encouraging a well rounded child (this was also the emphasis of the homes).

Insert Table 1

Materials:

Each observer had a stop watch and each observer team consisting of two observers had a tapedeck and a wireless microphone.

4 The author conducted the Bayley's. They were given to the Ss when they were between the ages of 24-28 months. There was a total sample of 110 subjects that the 48 Ss were selected from. It was extremely difficult matching the children on all of the above criteria because of the size of the sample. Therefore the Ss were matched as closely as possible, as can be seen in Table 1.

Table 1

Subjects Matched Demographically

Family Day Care				Group Day Care				Homes			
Ss	Sex	Age	IQ	Ss	Sex	Age	IQ	Ss	Sex	Age	IQ
S1	F	40	130	19	F	40	135	33	F	39	128
S9	F	38	130	22	F	40	130	34	F	38	126
S16	F	38	121	29	F	39	125	36	M	39	124
S2	M	40	120	24	F	38	119	44	F	37	121
S3	F	37	119	32	F	37	118	46	M	36	121
S11	F	36	118	30	M	37	117	43	M	37	120
S12	M	36	115	17	F	37	110	45	F	40	115
S7	F	36	109	28	F	36	108	47	F	36	114
S4	M	37	104	27	M	37	105	48	M	38	110
S13	M	38	101	18	M	36	105	40	F	39	101
S14	F	38	100	23	F	38	101	38	F	40	101
S5	F	39	100	31	M	40	100	37	F	38	100
S8	M	40	99	20	M	40	100	35	M	39	100
S6	M	39	98	25	M	40	99	42	M	37	98
S15	M	38	96	21	M	39	97	39	M	36	98
S10	M	36	95	26	M	36	94	41	M	37	95
Totals		37.9	109.7	Totals		38.1	110.2	Totals		37.8	110.8

Setting:

The centers and homes were in the Brentwood, Bay Shore, and Islip Townships located in the South-Central portion of Long Island, New York. These were low to middle income areas with a high concentration of Spanish speaking adults.

In each home and center there were well-defined activity areas with distinct boundaries as depicted in Figure 1 (if the homes did not have the well-defined areas, the author helped to set such areas up by providing the appropriate equipment for the areas and the necessary dividers for the room). These activity areas were a cognitive games area, a blocks area, an art area, a free play area, and a dramatic play area. The centers and

---

Insert Figure 1

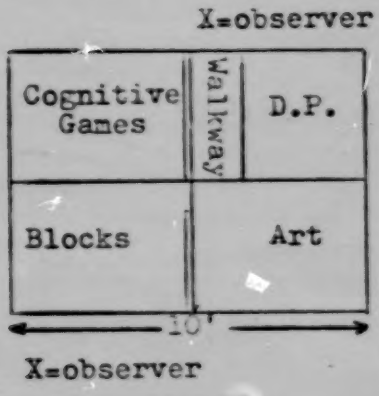
---

homes were matched as closely as possible for the locations of activity areas. That is, the cognitive games area was always adjacent to the dramatic play area. The

Figure 1

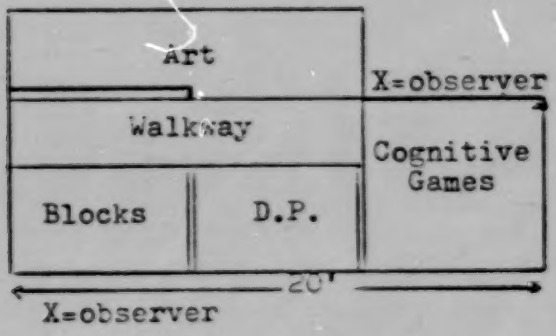
Layouts of a Home, a Family and
a Group Day Care Center

HOME

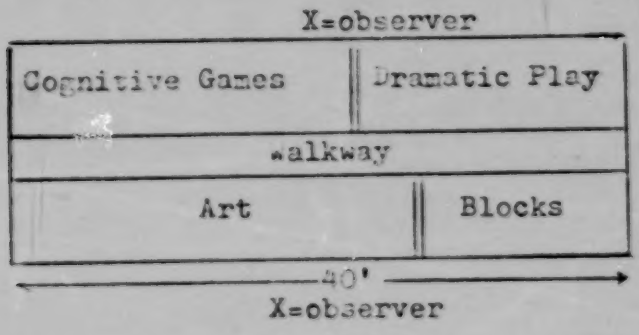


D.P.=Dramatic Play

FAMILY DAY CARE CENTER



GROUP DAY CARE CENTER



═══ Waist high (adult) shelves or toy cabinets acting as room dividers.

blocks area was always adjacent to or across from the dramatic play area. The art area was always adjacent to the blocks area. The free play area was always outdoors (See Figure 1). Activity areas were delineated on the following criteria: Blocks area--an area that contained any type of building toys (erector sets, unit blocks, hollow blocks); Art area--contained crayons, coloring books, easils, collage materials (felt, paper, scissors); Cognitive games area--contained puzzles, manipulative small muscle toys; Dramatic play area--contained dolls, carriages, dress-up materials; Free play area--contained outdoor equipment and large muscle equipment. Activity areas were broken off from each other by waist high (adult) shelves or toy cabinets. In all the centers and homes, all activity areas were emphasized equally (i.e. children spent an equal amount of time in all areas).

Recordings:

Three trained observer teams were used through the duration of the experiment. These observer teams recorded the verbalizations made by a child only if the child were actually in a particular activity area engaging in

an activity when verbalizing (i.e. child had to be playing--picking up a toy, reading a book, dressing up, pushing a toy, or pulling a toy--the child had to be acting on some object within a particular activity area). The observers recordings were entered on a observation record sheet (See Appendix 2, Tables 5 and 6 for sample record sheets). If the child were verbalizing but not in an activity area, or moving from activity area to activity area, or going to the bathroom (i.e. the child was not acting on some object within an activity area); this type of behavior was classified as "extraneous" behavior on a record sheet and no recordings were taken.

Subjects were free to move from activity area to activity area whenever they wished and were allowed to bring toys from activity area to activity area; however, their verbalizations were not recorded.

Procedure:

The observers who did the recordings are preschool teachers[5]. Three are females, three are males. Observer teams were one male and one female observer.

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5 The observers were: Toni Vaccarro, Andrew Clay, Stephen Wilson, Ruth Mayer, Josephine Jaferelo, and Joan Jonsaint.

Training of observer teams was conducted four weeks in advance to collecting the data for this study. Training consisted of having the observer teams use practice children in Day Care Centers that were not part of the project. Centers were chosen where the day care environment was very similiar to what the observer teams would encounter in the actual project. The observer teams were instructed to take down everything that the child said during a particular recording session.

The observer teams entered a center participating in the project two weeks prior to the collection of data so that the observer teams could work with the subjects in helping them adjust to wearing a wireless microphone and to having the observers in the centers and homes. As shown in Figure 1, the observers were located on the periphery of the room. The observers were free to move along the periphery of the room within the homes or centers in order to hear the children clearly. The observer teams spent 40 minutes in the morning between 10:00 A.M.--11:00 A.M. and 40 minutes in the afternoon between 1:30 P.M.--2:30 P.M. in the centers and homes. These times were selected for the staff interacted with the children as little as possible during this time. There was no large group play, the children were engaged

in solitary play and it was much easier recording the children's speech.

The observer teams spent the 40 minutes in the centers as follows: for the first ten minutes; first, the observer team would synchronize their stop watches such that each observer started observing at precisely the same time. Then the observers took longhand recordings and taperecordings (use of taperecorders is explained in Appendix 2) independent of each other of a subject. The particular subject was selected in advance. If this subject were absent, there was a make-up day at the end of the three weeks. Subjects' whereabouts when verbalizing (verbalizations were simple (V1) or complex (V2)--see Table 2 for McNeill's classification of sentence structures) was recorded and timed. For example, four minutes in cognitive games area playing with manipulative

---

Insert Table 2

---

toys, 30 seconds verbalizing--20 V1 and 10 V2 verbalizations; extraneous behavior in moving from area to area. Three minutes in dramatic play area in dressing up and

Table 2

McNeill's Classification of Sentence Structures

CATEGORY	SENTENCE STRUCTURE	CORRESPONDING GRAMATICAL RELATIONS
Simple Verbalization (V1)	P+N	modifier, head noun
	N+N	modifier, head noun, subject, predicate
	V+N	main verb, object
	N+V	subject, predicate
Complex Verbalization (V2)	P+N+N	modifier, head noun
	N+P+N	subject, predicate, modifier, head noun
	V+P+N	main verb, object, modifier, head noun
	V+N+N	main verb, object, modifier, head noun
	P+N+V	subject predicate, modifier, head noun
	N+N+V	subject, predicate, modifier, head noun
	N+V+N	main verb, object, subject predicate
	N+N+N	subject, predicate, modifier, head noun

playing with carriages, two minutes verbalizing--40 V1 and 35 V2 verbali-ations; extraneous behavior in going to the bathroom. Four minutes in cognitive games area playing with the manipulative toys, one and half minutes verbalizing--15 V1 and 10 V2 verbalizations. Total time of 10 minutes in activity areas, four minutes verbalizing --75 V1 and 55 V2 verbalizations made by Subject 1. For Subject 1 this was his first individual recording session. There would be eight more recording sessions identical to the above (See Appendix 5 for scheduling of observer teams and subjects).

In the next ten minute individual subject recording session, the observer team would again synchronize their stop watches, then they took longhand recordings and taperecordings independent of each other of a second subject.. This second subject was selected in advance. Procedure used with first subject was used with the second, third, and fourth subjects in order to finish out the 40 minutes of recordings. The total time for verbalizing for each subject over the three weeks was 90 minutes. All the observer teams recorded in all the centers and homes so that the 90 minutes recorded of each subject was 30 minutes of observer team α, 30 minutes of observer team β, and 30 minutes of observer team δ (see

Appendix 5).

In the homes there was a change in procedure. Homes were selected which were in close proximity to each other so that it was easy for an observer team to take their recordings in one home and then move over to another home easily. The individual subject recording sessions were 20 minutes rather than 10 minutes long of each child. The total recording sessions were 40 minutes. The recording sessions were identical to the procedure used in the centers. The only difference is that each individual subject recording session was 20 minutes rather than 10 minutes. The total time for verbalizing was 80 minutes for each subject in the homes over the three week period.

Reliability was calculated by each observer team after each 40 minute recording session. Reliability was calculated by taking the number of agreements between the two observers of an observer team for a particular area and for that particular recording session on the number of V1 and V2 verbalizations produced by a subject. Then this figure was divided by the number of agreements and disagreements between the two observers for that same area and recording session on the number of V1 and V2 verbalizations produced by the subject.

Reliability average were as follows: for observer

team α, observer team β, and observer team γ respectively: .96, .92, and .94 for the dramatic play area; .98, .97, and .90 for the cognitive games area; .97, .95, and .91 for the free play area; .96, .93, and .89 for the blocks area; and .97, .96, and .93 for the art area. See Appendix 2 for the actual calculations.

RESULTS

The principal analyses of the data were concerned with: (a) whether the subjects verbalized more in the Family Day Care Centers than in the Group Day Care Centers; (b) whether the V1 and V2 verbalization levels produced by the subjects were significantly different in the Family and Group Day Care Centers.

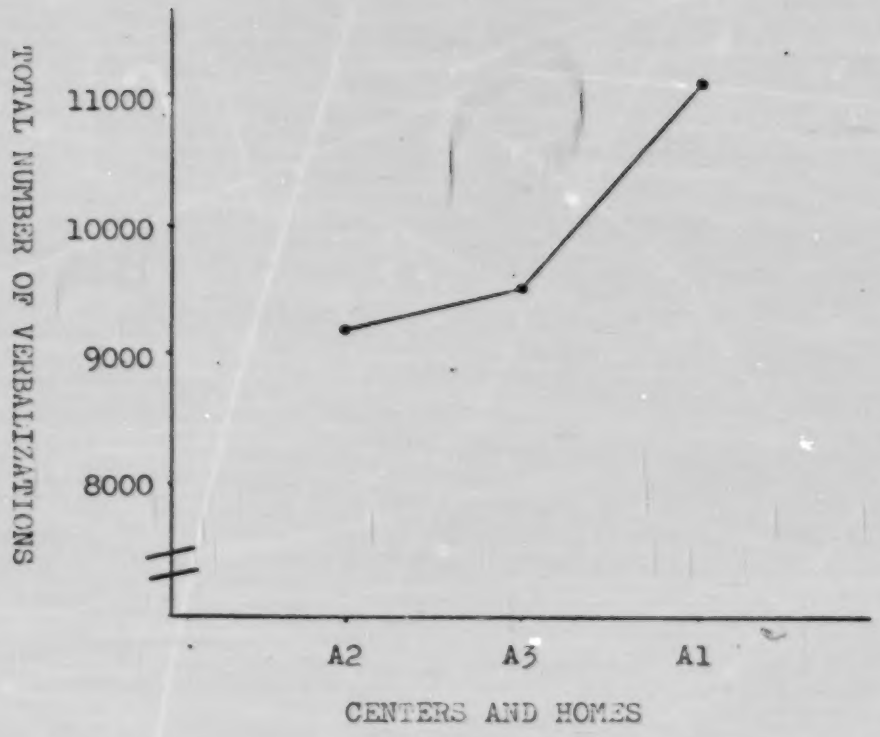
To analyze the verbalization levels produced by subjects within the centers and homes, the data was plotted as depicted in Figure 2. Figure 2 shows that the total verbalizations produced by the subjects in the Family Day Care Centers were significantly higher than the verbalizations produced by the subjects in the Group Day Care Centers and the Homes.

Insert Figure 2

Table 3 using a mixed design analysis of variance (Myers, 1972) shows that the children in the Family Day Care

Figure 2

Total number of verbalizations produced by Ss in various centers (Family Day Care Centers, Group Day Care Centers, and the Homes).



A3--Group Day Care Centers

A2--Homes

A1--Family Day Care Centers

Centers were significantly different from the children in the Group Day Care Centers and the Homes with respect to the total verbalizations produced by the subjects ($F=4.02$, $df=2$, $p < .05$).

Insert Table 3

Figure 3 illustrates how the rate of verbalizing differed in the Family and Group Day Care Centers, and the Homes on a cummulative basis. The subjects in the Family Day Care Centers had the highest rate of verbalizations per minute (7.89); followed by the Homes (7.49 verbalizations/minute); and lastly by the Group Day Care Centers (6.51 verbalizations/minute).

Insert Figure 3

How the rate of verbalizations differed in the Family and Group Day Care Centers, and the Homes on a day to day basis is shown in Figure 4. The subjects in the Family

Table 3

Analysis of Variance[6] for the study of Centers (Family Day Care Centers, Group Day Care Centers, and Homes); activity areas (cognitive games, art, blocks, dramatic play, and free play); and observer teams - α, β, and δ.

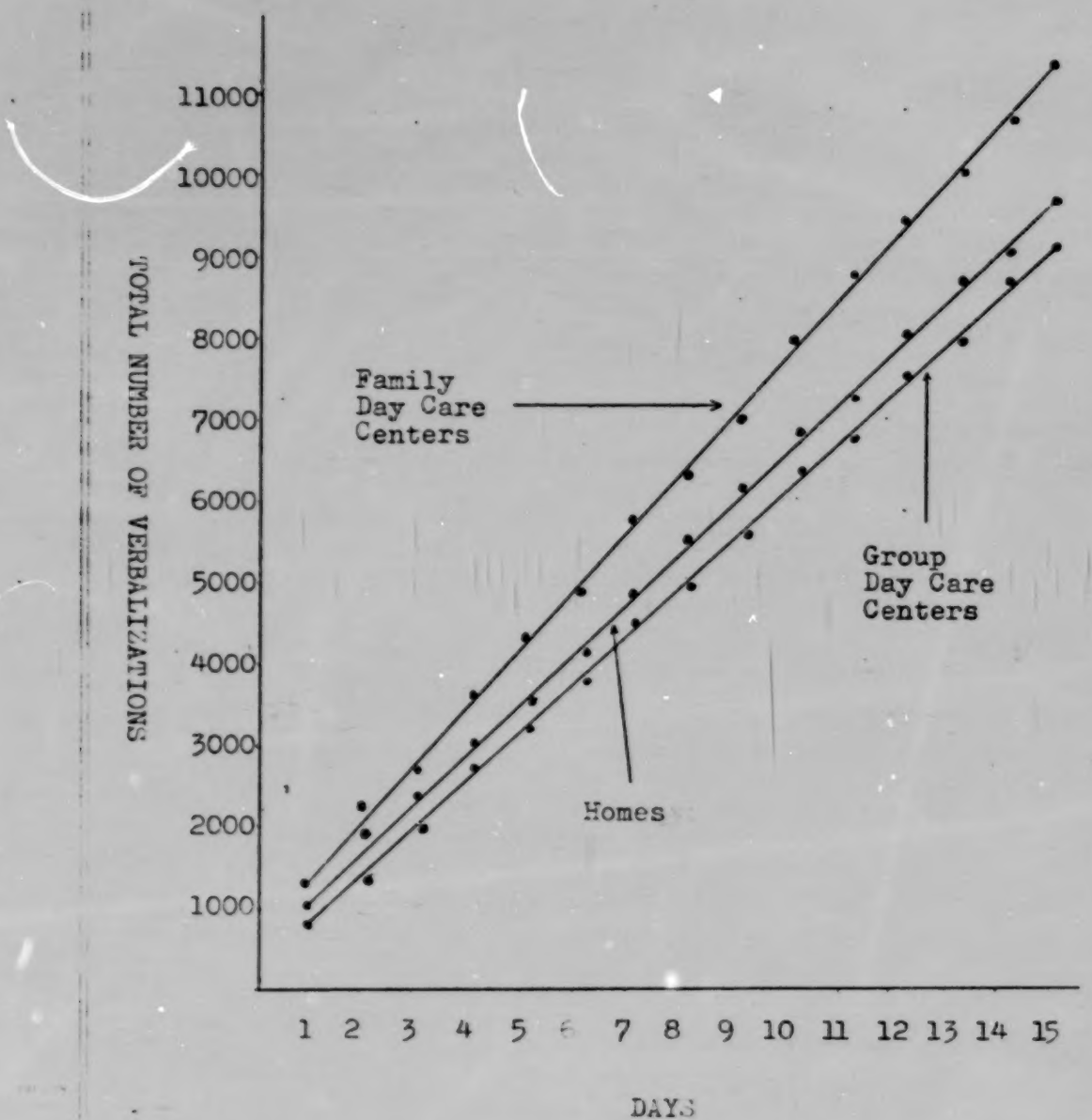
SOURCE	df	MS	F
Centers (A)	2	4701.98	4.02*
Activity Areas (B)	4	1585.20	5.47***
Observers (C)	2	11.69	0.89
Subjects (S)	47		
S(A)	45	1170.41	
A X B	8	779.96	2.69**
S(A)B	180	289.98	
A X C	4	45.22	0.67
S(A)C	90	68.04	
B X C	8	72.94	0.24
A X B X C	16	60.46	0.20
S(A)B X C	360	299.00	

* $p < .05$
** $p < .01$
*** $p < .001$

6 Myers, Jerome L., Fundamentals of Experimental Design, Second edition, Allyn and Bacon, Boston, 1972, pps 219-221. Analysis of Variance, one between- and two within-subjects variables.

Figure 3

Total number of verbalizations produced by Ss both simple and complex sentences included, on a cummulative basis for Family and Group Day Care and the Homes


TOTAL NUMBER OF VERBALIZATIONS
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
Family
Day Care
Centers
Group
Day Care
Centers
Homes
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
DAYS

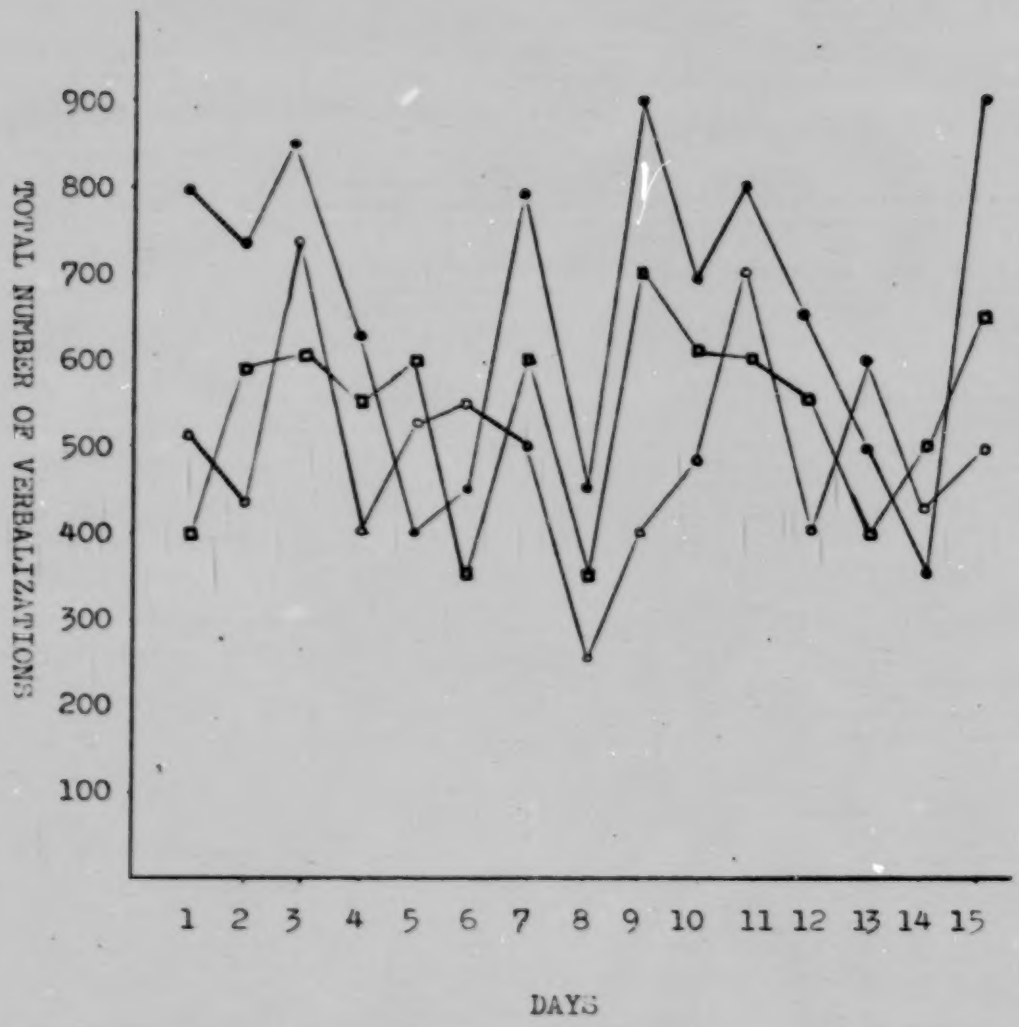
Day Care Centers had the highest mean of verbalizations per day (651.20); followed by the Homes (619.30 verbalizations/day); and lastly by the Group Day Care Centers (540.80 verbalizations/day).

Insert Figure 4

Figures 3 and 4 clearly demonstrate that the highest rates of verbalizing occurred in the Family Day Care Centers, followed by the Homes and Group Day Care Centers. However, the large gap between the verbalizations in the Family Day Care Centers and the Homes that exists in Figure 2 occurred because the total time spent in the Homes recording for the three weeks was only 1280 minutes while in the Family and Group Day Care Centers it was 1440 minutes of recording. Using the Homes' rate of verbalizations (7.49 verbalizations/minute) for 1440 minutes, there would not be as large a gap which exists between the Family Day Care Centers and the Homes. Figure 2 would show the Family Day Care Centers and the Homes much closer together in total verbalizations with the Group Day Care Center significantly lower.

Figure 4

Total number of verbalizations produced by Ss both simple and complex sentences, on a day to day basis for Family Day Care, Group Day Care, and Homes


TOTAL NUMBER OF VERBALIZATIONS
900
800
700
600
500
400
300
200
100
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
DAYS
Family D.C.C.
Group D.C.C.
Homes

In Figure 4 the Family and Group Day Care Centers and the Homes are all increasing or decreasing together in their levels of verbalizations on certain days (six days--day 3, 4, 7, 8, 11, 15). For instance, on the eigth day both the Family and Group Day Care Centers and the Homes are all decreasing to very low verbalization levels. The reason for this is that there was no free play outdoors because it rained on that particular day. The loss of this activity area (free play), which was the second highest activity area in eliciting verbalizations from the children, did affect the total verbalization level for that day. The low points on Figure 4 usually indicated that the children were confined indoors for part or all of the day because of poor weather. The children were then spending more time in activity areas that did not yield as high verbalization levels as the free play area. The high points usually indicated a recovery with the children engaging in free play on the following days.

Another way of presenting the data in Figure 4 is to look at the amount of verbalizing that occurred in the activity areas over the total three weeks period of data gathering. Figure 5 shows that the variability occurred amongst the activity areas because the least amount of

verbalizing during the three weeks was done in the block areas, followed by art, cognitive games areas which were essentially the same, with the most verbalizing in the dramatic play and free play areas in all the centers and

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Insert Figure 5

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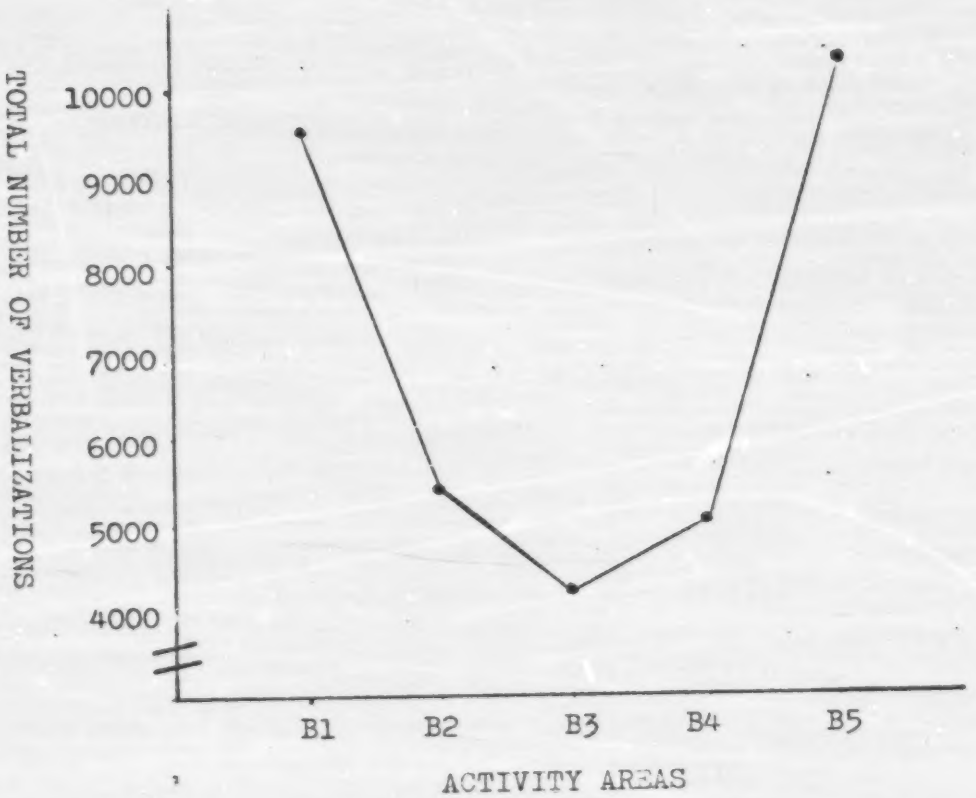
homes. Therefore, if the children were indoors and could not use the free play activity area, there would be a lower level of total verbalizations for that day in all the centers and homes. This occurred because the subjects had to spend more time in the blocks, art, and cognitive games areas, which were significantly lower than the free play and dramatic play areas in eliciting verbalizations. Table 3 shows how activity area were significantly different in the total verbalizations produced by subjects ($F=5.47$, $df=4$, $p < .001$).

The other part of the analysis was whether the V1 and V2 verbalizations differed in the Family and Group Day Care Centers, and the Homes. In Table 4, an analysis was done using t-tests to find significant differences between means of V1 and V2 verbalizations produced by

Figure 5

Total number of verbalizations produced by Ss in activity areas (cognitive games, art, blocks, free play, dramatic play).



B1--Free play area

B2--Cognitive games area

B3--Blocks area

B4--Art area

B5--Dramatic play area

subjects in the Family and Group Day Care Centers. Table 4 shows that significantly more V2 verbalizations were made by subjects than V1 verbalizations in the Family Day Care Centers ($t=4.43$, $p < .05$).

Insert Table 4

Also, there were significantly more V2 verbalizations made by subjects in the Family Day Care Centers than V2 verbalizations made by subjects in the Group Day Care Centers ($t=5.67$, $p < .05$). However, there were significantly more V1 and V2 verbalizations made by subjects in the Group Day Care Centers ($t=3.61$, $p < .10$). These results explain how the interaction of centers and activity areas were significant. The Family Day Care Centers had significantly more verbalizations than the Group Day Care Centers because of the greater number of V2 verbalizations produced by the subjects. Therefore, the subjects that were in a particular activity area in the Family Day Care Centers produced more verbalizations than the subjects in an equivalent activity area in the Group Day Care Centers, because significantly more V2 verbalizations

Table 4

Comparison of V2 and V1 verbalizations produced by subjects in Family and Group Day Care Centers using t-test for differences between means

	V2	V1	t-diff[7]
Family Day Care Centers	7364	4551	4.43**
Group Day Care Centers	3812	5788	3.61*
t-diff[7]	5.67**	3.01*	

* $p < .10$
** $p < .05$

7 Hays, William L., Statistics For Psychologists, Holt, Rinehart, and Winston, New York, 1963, pps 320-322. T-distribution to test hypotheses about differences

were produced by the subjects in the Family Day Care Centers. Table 3 shows how the interaction of activity areas and centers were significantly different in the total verbalizations produced by subjects ($F=2.69$, $df=8$, $p < .01$).

DISCUSSION

From previous pilot studies (Fiene, 1972a,b) it was suggested that children verbalize at different levels of complexity and at different rates when they are in different activity areas. This study has clearly demonstrated that children verbalize at different levels and complexities when experiencing different types of custodial environments (i.e. Family Day Care Center, Home environment, and Group Day Care Center) as well as supporting the previous finding. The interaction of activity areas with centers was also significant. For example, the dramatic play area elicits more complex verbaliations in the Family Day Care Center than in the Group Day Care Center. The Family Day Care Center appears to be producing an environment that is more conducive for communicating verbally at the child's level than the Group Day Care Center. The child is verbalizing more and at a more sophisticated level in all activity areas in the Family Day Care Center.

Keeping the sample used in this study in mind, some of these statements should be qualified. The Family and Group Day Care Centers that were part of this sample

should be considered above average in the staff educational background (90 % of the teachers in the centers had B.A.'s or above), the equipment used was of a high quality (SRA, Montessori), and the centers themselves were spacious and attractive. No claim is made that the sample used in this study was representative of Family and Group Day Care across the nation. In the Family Day Care Centers observed, generally there was a closer child-adult interpersonal relationship. In the Group Day Care Center, the adults had more of a condescending attitude towards the children and usually felt the children were more unruly than the reports I received from the adults in the Family Day Care Centers about their children.

These attitudes of the adults (teachers) appeared to indluence the types of verbalizations between adults and children. The teachers in the Group Day Care Center were usually engaged in a question and answer form of verbalizing with the children. Or it was in the form of commands given to the children. The children need only respond with a couple of words when conversing with the teachers. The teachers, perhaps because of the size of the group in the Group Day Care Center, had relatively little time available to spend verbalizing or interacting

with individual children. The adults (teachers) in the Family Day Care Centers, because of the small size of the center, had more time to spend verbalizing with individual children in "meaningful" passages for greater durations.

An implication is that the particular environments influenced the character of the adult-child verbal interactions which in the case of the Family Day Care Centers caused more verbalizations to be elicited by the subjects. These verbalizations being at a more sophisticated level. In the Group Day Care Centers, the teachers and children just were not verbalizing as much because of pressures incurred by the curriculum, parent expectations of children's progress, and sheer number of children (solutions will be discussed later).

Returning to the fact that children verbalize at different levels of complexity and at different rates when experiencing different activity areas, there are several implications which must be discussed. In reviewing the data on pages 53-67, and of Figure 5, it is evident that all the activity areas located in the Family Day Care Centers have higher verbalizations levels because of the greater number of V2 verbalizations pro-

duced by the subjects. This explains why the verbalization levels are different in the activity areas across the centers; it does not explain how the activity areas within a particular center differs in verbalization levels. A possible explanation is that the play patterns engaged in by Ss in the various activity areas are more conducive or facilitative to verbalizing. For instance, the play patterns in the Dramatic Play area were very conducive to children verbalizing. The children both in the Family and Group Day Care Settings engaged in a great deal of social behavior (playing house, doctor) which requires a great deal of verbalizing for it to be successful. In contrast, the blocks area had relatively little verbalizing done in both the Family and Group Day Care Settings. The nature of this activity area, where each child works alone with relatively little social interaction, is that little verbalizing occurs. The cognitive games and art areas were similiar to the blocks area with little verbalizing because the children were engaged in an activity by themselves. The free play area was more like the dramatic play area because of the availability to socialize and communicate each others needs.

The interaction of activity areas and centers seem-

ed to occur because the subjects in the Family Day Care Centers produced more V2 verbalizations across all activity areas; and the subjects were eliciting different rates of verbalizations in the activity areas. For example, the dramatic play area is a high elicitor of verbalizations. This activity area in a Family Day Care Center, which appears to be a more conducive environment for verbalizing, will elicit a great number of verbalizations from its subjects. In contrast, a blocks area which was a low elicitor of verbalizations, placed within a Group Day Care Center, which seems not to be as conducive an environment for verbalizing, will elicit very few verbalizations.

This is an important point because when a high verbal producing activity area (e.g. dramatic play) is within a Family Day Care Center, the great number of verbalizations produced by its subjects causes the high output of V2 verbalizations. The data clearly indicates that learning environments which are facilitative in producing verbalizations (e.g. dramatic play, and a Family Day Care Center) will have a more likely chance of producing sophisticated sentence structures (V2 verbalizations). When a low verbal producing activity area (e.g. blocks)

is within a Group Day Care Center, the smaller number of verbalizations produced by its subjects causes the low output of V2 verbalizations. The data indicates that learning environments which are not facilitative in producing verbalizations (e.g. blocks and a Group Day Care Center) will not produce many sophisticated sentence structures (V2 verbalizations). It appears that volume of verbalizations produced correlates highly with the complexity of verbalizations produced. The greater the volume, the higher the complexity.

In looking at all the data for the interaction of centers and activity areas, it appears that the centers have more of an effect on the verbalizations produced in the activity areas. The reason for this is that centers have biases (e.g. teacher preference for cognitive development) that are going to affect all the activity areas. The activity areas are made to fit the biases of the center rather than the center fitting the activity areas.

If one is to assume that a high level of verbalizations is a goal of pre-school learning environments, then how can Group Day Care Centers be more of a facilitator of producing verbalizations? Certainly the size

of many Group Day Care Centers can be decreased which will permit a lower adult to child ratio. Definitely not more than five children to one adult should be maintained in order for this to be effective. This would give the adult more time to spend verbalizing with individual children. Another method to increase verbalizations is to alter play patterns. For instance, in a cognitive games area, which is not a very high elicitor of verbalizations, when a child is partaking in an activity an adult could begin talking to the child about what he/she is playing with rather than leaving the child to play by himself. Also, in very large centers, where it is not feasible to cut down its enrollment, another form of altering play patterns could be used. with older children, four and five years old, a contingency system (can be modified for younger children) can be used where a child must verbalize with adults in going from activity area to activity area.(the adults are stationed at every activity area). The child is only rewarded for the production of sophisticated sentence structures. These suggestions may work in some day care learning environments, but definitely not in all. Only an individually prscribed curriculum geared for the needs

of each individual center will be appropriate.

REFERENCE PAGE

Baumrind, Diana, "Will a Day Care Center Be a Child Development Center?", Journal of Young Children, Vol. XXVIII, No. 3, February, 1973, pps 172-184.

Brown, Roger, Words and Things, The Free Press, Glencoe, Illinois, 1958, pps 22-55.

Caldwell, B.M., "What Does Research Teach Us About Day Care", Journal of Children Today, January-February, 1972, pps 6-11.

Cazden, C.B., "Suggestions from Studies of Early Acquisition", Childhood Education, December, 1969, Vol. 46, No. 3, pps 117-131.

Cazden, C.B., "Evaluating Language Learning in Early Childhood Education", In B.S. Bloom, T. Hasting, and G. Madaus (Eds.), Formative and Evaluation of Student Learning, New York: Mc Graw Hill (in press)

Chandler, Caroline, Early Child Care, Atherton Press, New York, 1968, pps 68-105, 257-282.

Evans, Ellis D., Contemporary Influences in Early Childhood Education, Holt, Rinehart, and Winston, 1971, pps 105-139.

Ervin, S.M., "Imitation and Structural Changes in Children's Language", In E.H. Lenneberg (Ed.), New Directions in the Study of Language, Cambridge; M.I.T. Press, 1964, pps 163-190.

Fein, Greta and Stewart, Clarke A., Day Care in Context, John Wiley & Sons, New York, 1973, pps 73-97.

Fiene, Richard J., "Movement and Time Spent in Verbalizations in Family and Group Day Care Centers", Research Relating to Children, September-February, 1973-74, Bulletin 34.

Fiene, Richard J., "Time Spent in N-V versus N-V-A Sentence Structures in Family and Group Day Care Centers", Research Relating to Children, September-February, 1973-74, Bulletin 34.

Gleason, J.B., "Do Children Imitate?", Proceedings of the International Conference on Oral Education of the Deaf, June 17-24, 1967, Vol II, pps 1441-48.

Goodman, K.S., "On Valuing Diversity in Language", Childhood Education, December 1969, Vol. 46, No. 3, pps 123-126.

Gordon, Ira, J., "Success and Accountability", Childhood Education, April 1969, Vol 48, No. 7, pps 338-348.

Grothberg, E.H., Day Care: Resources for Decisions , Office of Economic Opportunity, pps 90-108.

Hayes, William, Statistics for Psychologists, Holt, Rinehart, and Winston, New York, 1963, pps 320-322.

Hess, R.D. & Croft, D.J., Teachers of Young Children, Houghtin Mifflin Co., New York, 1972, pps 172-184.

Hess, R.D., Early Education, Aldine Publishing Co., Chicago, 1968, pps 131-142.

Hirsch, E.S., "What Are Good Responsive Environments for Young Children", Journal of Young Children, Vol. 28, No. 2, Dec 1972, pps 75-80.

Hoffman, Martin L., Child Development Research, Russell Sage Foundation, New York, 1966, pps 55-106.

Irvin, O.C., "Infant Speech: The Effect of Family Occupational Status and of Age on Use of Sound Types", Journal of Speech Disorders, 13, (1948), pps 320-323.

Isaacs, Susan, Intellectual Growth in Young Children, Schoken Books, New York, 1966, pps 57-97.

Karnes, M.S. & Hodgins, A.S., Research and Development Program on Preschool Disadvantaged Children, Vol. I, Project No. 5-1181, Contract No. OE 6-10-235, May, 1969. United State Department of Health, Education, and Welfare, Office of Education, Bureau of Research.

Keister, M.E., & Saunders, S., "Family Day Care: Some Observations", 1972, University of North Carolina, Greensboro, unpublished manuscript.

Keister, M.E., "The Good Life" for Infants and Toddlers, Washington, D.C., National Association for the Education of Young Children, 1970.

Leeper, S.H., Good Schools for Young Children, The Mac Millian Co., London, 1971, pps 45-52.

LeLaurin, K. & Risley, T., "The Organization of Day Care Environments: Zone versus Man to Man Staff Assignments", (Fall, 1972), Vol. 5, No. 3, pps 225-232, Journal of the Applied Analysis of Behavior.

Levenstein, P., "Verbal Interaction Project Manual", 1970, Freeport, New York.

Matthews, G.H., "Analysis by Synthesis of Sentences of Natural Languages", (London: National Physics Laboratory Symposium, No. 13, 1961), pps 531-543.

McCarthy, D., Language Development of the Pre-School Child, (Minneapolis: University of Minnesota Press, 1930).

McNeill, D., The Acquisition of Language, Harper and Row Publishers, New York, 1970, pps 15-57.

Menyuk, Paula, Sentences Children Use, The M.I.T. Press, Cambridge, Mass., 1969, pps 25-58.

Myers, Jerome L., "Fundamentals of Experimental Design, Allyn and Bacon, Boston, Mass. (1972), pps 550-550.

Palermo, D.S. & Lipsitt, L., Research Readings in Child Psychology, Holt, Rinehart, and Winston, Inc., New York, pps 336-385.

Palmer, F.H.,"Minimal Intervention atAge Two and Three and Subsequent Intellective Changes", In R.H. Parker (Ed.), Conceptualizations in Preschool Curricula, Boston, Allyn and Bacon.

Parker, R.H., The Preschool in Action, Allyn and Bacon, Boston, 1972, pps 466-506.

Pauposek, H., "Effects of Group Rearing Conditions During the Preschool Years of Life", Paper to be read at AAAS meeting in Boston, 1969.

Pigge, F.L., "A Comparison of Yielding to Influence in Open and Traditional Classrooms", Childhood Education, October 1972, Vol. 49, No. 1, pps 39-44.

Prescott, E., & Jones, E., "Day Care As A Child-Rearing Environment", Vol II, National Association for the Education of Young Children, Wash. D.C., 1972, pps 21-24, 42-44.

Rosenberg, P.S., "Phrase Structure Principles of English Complex Sentence Formation", Journal of Linguistics, 3, 1967, pps 103-111.

Sale, J.S., "Family Day Care--A Valuable Alternative", Journal of Young Children, Vol. XXVIII, No. 4, April 1973, pps 209-215.

Swenson, J.P., Alternatives in Quality Care, Day Care and Child Development Council of America, 1972, pps 27-54.

Vygotsky, L.A., Thought and Language, (Cambridge, Mass., The M.I.T. Press, 1962).

Weikart, David P., "Cognitively Oriented Model", In Hess and Croft, Teachers of Young Children, Houghtin Mifflin, Co., New York, 1972, pps 172-184.

Zigler, Edward, "The Environmental Mystique", Childhood Education, May 1970, Vol. 46, No. 8, pps 403-412.

APPENDICES 1-5

APPENDIX 1--Sample of a child's speech

APPENDIX 2--Reliability coefficients

APPENDIX 3--Comparisons of V1 and V2 verbalizations produced by subjects in the various activity areas (Table 8--Table 23).

APPENDIX 4--Comparison of V2 and V1 verbalizations produced by subjects in Centers and Homes using t-test for differences between means (Table 24--Table 25).

APPENDIX 5--Scheduling of observer teams for the three week observational period.

APPENDIX 1

Sample of a child's speech

SAMPLE OF A CHILD'S SPEECH--All recordings in this sample occurred in the cognitive games area.

What the observer records	What the observer hears
V1	I wanna
V2	I wanna nother one
V1	turn
V2	I turn own way
V1	Nails
V2	Don't hit the screws
V1	see
V1	I turn
V2	me turn it
V1	want out
V2	let me pull hare
V2	now take out
V1	take out
V1	please
V1	this one
V1	there
V2	watch your hand
V2	I ganna hit you
V2	take it please

What the observer records	What the observer hears
V1	please
V2	Take it out
V2	take it out again
V2	take it out
V1	no, no
V2	Bill get it
V1	please
V1	thank you
V2	this one is
V2	this is a srew
V2	not this one
V2	I hit me
V2	what is this
V1	bottom
V1	okay
V1	look it
V2	Bill take out
V2	please start it
V1	now

APPENDIX 2

Reliability Coefficients

The observer teams spent a total of 90 hours in observations over a three week period. That was 270 hours of observations for all six observers. Eighty minutes a day were spent in taking longhand recordings of the children's speech. Another hour right after the recording session was spent in reliability checks between the two observers. This was checked from their longhand record sheets that the observers were keeping on the Ss. The tapes that were taken were only to be used as a back-up to check for disagreements between the two observers' record sheets (see Tables 5 & 6). One observer took

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Insert Tables 5 & 6

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longhand recordings and taperecordings, the other observer took only longhand recordings. The observers kept track of times through the use of stop watches. The observers checked times to make sure they were in agreement that a particular child they were observing was in certain areas at particular times. If there were disagreements that the observers found when checking their longhand recordings, then the two observers would play

Table 5

A sample record observation sheet where V1 and V2 verbalizations were recorded

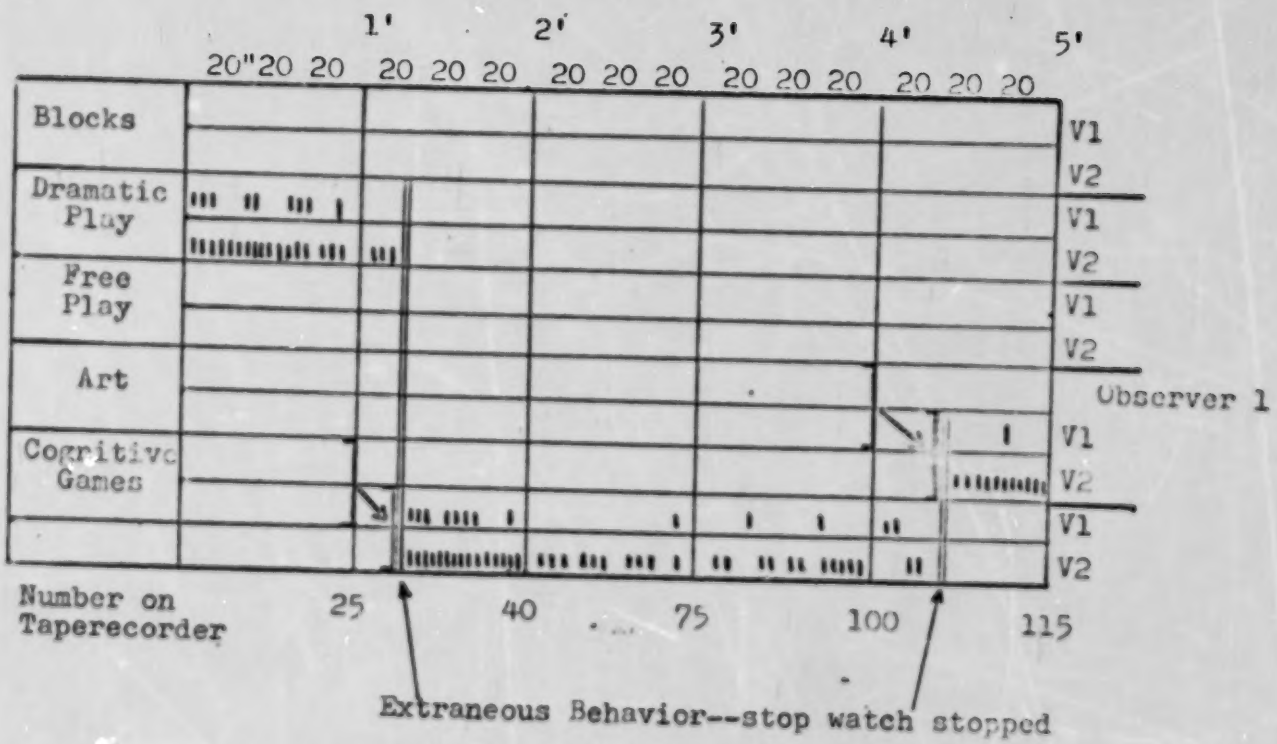
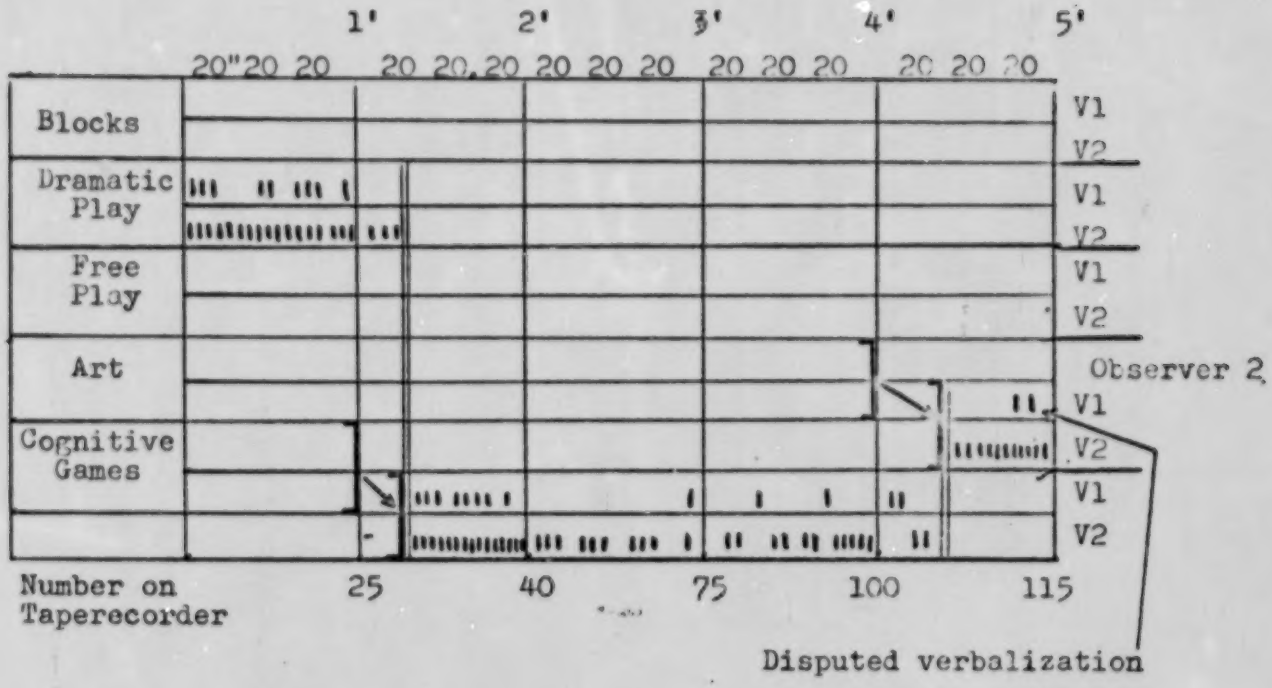


Table 6

A sample record observation sheet where V1 and V2 verbalizations were recorded



the tape back and recheck their recordings for that particular recording session. It was always brought to the author's attention when there was a disagreement--the observers counted the disagreement, however, when calculating reliability. The author acted as a third check and counted the disagreements in verbalizations as conservatively as possible in the final tabulation. A tally was kept by the person with the taperecorder of the number on the taperecorder as every 30 seconds passed (see Table 5 & 6) so that in returning to the taperecorder for the particular verbalization that was being disputed, it could be easily found by the observers.

A typical day would go as follows: the observers would enter a center or home, set-up and record both by longhand and taperecorder. After the session they would leave to go to a quiet area to check their recordings.

Insert Table 7

The observers would then go through the record sheets and check for agreements and disagreements. Once the agreements and disagreements were decided on, a reliab-

Table 7

Structuring of data for the calculation of the reliability coefficient

		D.P.		C. G.		Art		
		V1	V2	V1	V2	V1	V2	
Observer Team L	Observer 1	09	17	15	40	01	11	(A) Agreements
		00	00	00	00	01	00	(D) Disagreements
	Observer 2	09	17	15	40	01	11	(A) Agreements
		00	00	00	00	01	00	(D) Disagreements

D.P.=Dramatic Play; C.G.=Cognitive Games

ibility coefficient was calculated (see Table 7). Using the data from Tables 5 & 6 and the structuring of the data as shown in Table 7, a reliability coefficient was calculated as follows:

Calculation of Reliability Coefficient

Dramatic Play (D.P.)--V1

$$\frac{A}{A+D}=\frac{9}{9+0}= 1.00$$

Art--V1

$$\frac{A}{A+D}=\frac{1}{1+1}= 0.50$$

APPENDIX 3

Comparisons of V1 and V2 verbalizations produced by subjects in the various activity areas (Table 8-Table 22)

Table 8

Comparison of V1 and V2 verbalizations produced by subjects in the free play area in the Family Day Care Centers

	V1	V2
Observer team α	250	529
Observer team β	305	514
Observer team γ	274	518
Totals	829	1561

Source of Variance	df	Verbalizations	t-diff[8]
Family D.C.C. (A1) Free play area(B1)	10	1561-829	6.25**

** $p < .01$

8 Hays, William L., Statistics For Psychologists, Holt, Rinehart and Winston, New York, 1963, pps 320-322. t-distribution to test hypotheses about differences.

Table 9

Comparison of V1 and V2 verbalizations produced by subjects in the cognitive games area in the Family Day Care Centers

	V1	V2
Observer team α	306	350
Observer team β	257	461
Observer team γ	333	438
Totals	896	1249

Source of Variance	df	Verbalizations	t-diff
Family D.C.C. (A1) Cognitive games (B2)	10	1249-896	3.75**

** $p < .01$

Table 10

Comparison of V1 and V2 verbalizations produced in the blocks area in the Family Day Care Centers

	V1	V2
Observer team α	232	456
Observer team β	230	417
Observer team γ	270	334
Totals	745	1215

Source of Variance	df	Verbalizations	t-diff
Family D.C.C. (A1) Blocks (B3)	10	1215-745	4.31**

** $p < .01$

Table 11

Comparison of V1 and V2 verbalizations produced in the art area in the Family Day Care Centers

	V1	V2
Observer team α	297	438
Observer team β	271	423
Observer team γ	249	496
Totals	817	1357

Source of Variance	df	Verbalizations	t-diff
Family D.C.C. (A1) Art area (B4)	10	1357-817	4.39**

** $p < .01$

Table 12

Comparison of V1 and V2 verbalizations produced by subjects in the dramatic play area in the Family Day Care Centers

	V1	V2
Observer team α	357	547
Observer team β	312	551
Observer team γ	333	524
Totals	1002	1622

Source of Variance	df	Verbalizations	t-diff
Family D.C.C. (A1) Dramatic Play (B5)	10	1622-1002	6.04**

** $p < .01$

Table 13

Comparison of V1 and V2 verbalizations produced by subjects in the free play area in the Group Day Care Centers

	V1	V2
Observer team α	411	262
Observer team β	431	206
Observer team γ	398	264
Totals	1240	732

Source of Variance	df	Verbalizations	t-diff
Group D.C.C. (A2) Free play (B1)	10	1240-732	4.54**

** $p < .01$

Table 14

Comparison of V1 and V2 verbalizations produced by subjects in the cognitive games area in the Group Day Care Center

	V1	V2
Observer team α	387	220
Observer team β	342	210
Observer team γ	347	235
Totals	1076	665

Source of Variance	df	Verbalizations	t-diff
Group D.C.C. (A2) Cognitive games (B2)	10	1076-665	3.44*

* $p < .05$

Table 15

Comparison of V1 and V2 verbalizations produced by subjects in the blocks area in the Group Day Care Center

	V1	V2
Observer team α	269	195
Observer team β	341	183
Observer team γ	341	227
Totals	951	605

Source of Variance	df	Verbalizations	t-diff
Group D.C.C. (A2) Blocks (B3)	10	951-605	3.45*

* $p < .05$

Table 16

Comparison of V1 and V2 verbalizations produced by subjects in the art area in the Group Day Care Centers

	V1	V2
Observer team α	382	269
Observer team β	383	350
Observer team γ	391	287
Totals	1156	906

Source of Variance	df	Verbalizations	t-diff
Group D.C.C. (A2) Art (R4)	10	1156-906	2.69

Table 17

Comparison of V1 and V2 verbalizations produced by subjects in the dramatic play area in the Group Day Care Centers

	V1	V2
Observer team α	436	284
Observer team β	383	276
Observer team γ	418	233
Totals	1237	793

Source of Variance	df	Verbalizations	t-diff
Group D.C.C. (A2) Dramatic Play (B5)	10	1237-793	4.28**

** $p < .01$

Table 18

Comparison of V1 and V2 verbalizations produced by subjects in the free play area in the Homes

	V1	V2
Observer team α	254	362
Observer team β	294	283
Observer team δ	255	322
Totals	803	967

Source of Variance	df	Verbalizations	t-diff
Homes (A3) Free Play (B1)	10	967-803	4.51**

** $p < .01$

Table 19

Comparison of V1 and V2 verbalizations produced by subjects in the cognitive games area in the Homes

	V1	V2
Observer team α	332	374
Observer team β	402	412
Observer team δ	333	376
Totals	1067	1162

Source of Variance	df	Verbalizations	t-diff
Homes (A3) Cognitive games (B2	10	1162-1067	2.68

Table 20

Comparison of V1 and V2 verbalizations produced by subjects in the blocks area in the Homes

	V1	V2
Observer team α	237	315
Observer team β	317	294
Observer team γ	288	347
Totals	842	956

Source of Variance	df	Verbalizations	t-diff
Homes (A3) Blocks (B3)	10	956-842	1.77

Table 21

Comparison of V1 and V2 verbalizations pro- by subjects in the art area in the Homes

	V1	V2
Observer team α	319	364
Observer team β	277	390
Observer team γ	291	322
Totals	887	1076

Source of Variance	df	Verbalizations	t-diff
Homes (A3) Art (B4)	10	1076-887	3.95**

** $p < .05$

Table 22

Comparison of V1 and V2 verbalizations produced by subjects in the dramatic play area in the Homes

	V1	V2
Observer team α	316	347
Observer team β	322	370
Observer team γ	251	361
Totals	889	1078

Source of Variance	df	Verbalizations	t-diff
Homes (A3) Dramatic Play (B5)	10	1078-889	2.70

APPENDIX 4

Comparison of V1 and V2 verbalizations produced by subjects in Centers and Homes using t-test for differences between means (Table 23--Table 24)

Table 23

Comparison of V2 and V1 verbalizations produced by subjects in Family Day Care Centers and Homes using t-test for differences between means

	V2	V1	t-diff
Homes	5208	4341	2.19
Family Day Care Centers	7364	4551	4.43**
t-diff[9]	3.63*	0.72	

* $p < .10$
** $p < .05$

9 Hays, William L., Statistics for Psychologists, Holt, Rinehart, and Winston, New York, 1963, pps 320-322. t-distribution to test hypotheses about differences.

Table 24

Comparison of V2 and V1 verbalizations produced by subjects in Group Day Care Centers and Homes using t-test for differences between means

	V2	V1	t-diff
Homes	5208	4341	2.19
Group Day Care Centers	3812	5788	3.51*
t-diff	3.16*	3.25*	

* $p < .10$

APPENDIX 5

Scheduling of observer teams

Table 25

Group Day Care Centers--Scheduling of observer teams

	DAYS															
Ss	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
17	M α		M γ		M δ		M β		A α		A δ		A β		A α	
18	M β		M α		M δ		M γ		A α		A δ		A β		A α	
19	M γ		M α		M δ		M β		A α		A δ		A β		A α	
20	M β		M α		M δ		M β		A α		A δ		A β		A α	
21		M δ		M β		M α		M γ		A β		A α		A δ		
22		M δ		M β		M α		M γ		A β		A α		A δ		
23		M δ		M β		M α		M δ		A β		A α		A δ		
24		M δ		M β		M α		M δ		A β		A α		A δ		
25		A δ		A β		A α		A γ		M β		M α		M δ		
26		A δ		A β		A α		A δ		M β		M α		M γ		
27		A δ		A β		A α		A δ		M β		M α		M δ		
28		A δ		A β		A α		A δ		M β		M α		M γ		
29	A β		A α		A δ		A β		M γ		M δ		A β		M α	
30	A γ		A α		A δ		A β		M α		M δ		M β		M α	
31	A β		M α		A δ		A β		M α		M δ		A β		M α	
32	M α		M α		A δ		A β		M α		M δ		A β		M α	

α, β, γ --Observer teams
A--Afternoon
M--Morning
Observer teams were randomly assigned
Periodically individual observers would switch assignments--one from longhand and taperecorder to only longhand
Assignments were made to balance mornings and afternoons

Table 26

Family Day Care Centers--Scheduling of observer teams--

	DAYS															
Ss	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																

Table 27

Homes--Scheduling of observer teams

	DAYS																
Ss	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
33																	
34																	
35																	
36																	
37																	
38																	
39																	
40																	
41																	
42																	
43																	
44																	
45																	
46																	